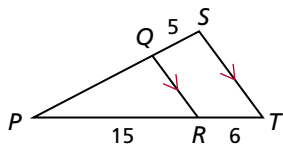


7-4 Applying Properties of Similar Triangles (pp. 481–487)

EXAMPLES

- Find PQ .



It is given that $\overline{QR} \parallel \overline{ST}$, so $\frac{PQ}{QS} = \frac{PR}{RT}$ by the Triangle Proportionality Theorem.

$$\frac{PQ}{5} = \frac{15}{6} \quad \text{Substitute 5 for QS, 15 for PR, and 6 for RT.}$$

$$6(PQ) = 75 \quad \text{Cross Products Prop.}$$

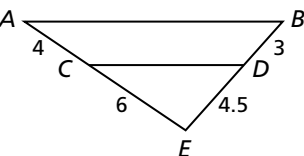
$$PQ = 12.5 \quad \text{Divide both sides by 6.}$$

- Verify that $\overline{AB} \parallel \overline{CD}$.

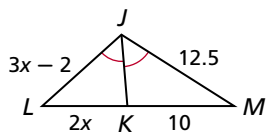
$$\frac{EC}{CA} = \frac{6}{4} = 1.5$$

$$\frac{ED}{DB} = \frac{4.5}{3} = 1.5$$

Since $\frac{EC}{CA} = \frac{ED}{DB}$, $\overline{AB} \parallel \overline{CD}$ by the Converse of the Triangle Proportionality Theorem.



- Find JL and LK .



Since \overline{JK} bisects $\angle LJM$, $\frac{JL}{LK} = \frac{JM}{MK}$ by the Triangle Angle Bisector Theorem.

$$\frac{3x - 2}{2x} = \frac{12.5}{10} \quad \text{Substitute the given values.}$$

$$10(3x - 2) = 12.5(2x) \quad \text{Cross Products Prop.}$$

$$30x - 20 = 25x \quad \text{Simplify.}$$

$$30x = 25x + 20 \quad \text{Add 20 to both sides.}$$

$$5x = 20 \quad \text{Subtract 25x from both sides.}$$

$$x = 4 \quad \text{Divide both sides by 5.}$$

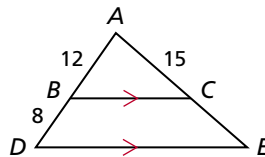
$$\begin{aligned} JL &= 3x - 2 \\ &= 3(4) - 2 = 10 \end{aligned}$$

$$\begin{aligned} LK &= 2x \\ &= 2(4) = 8 \end{aligned}$$

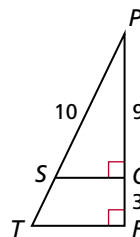
EXERCISES

Find each length.

21. CE

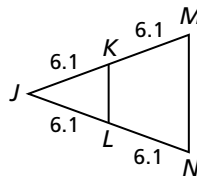


22. ST

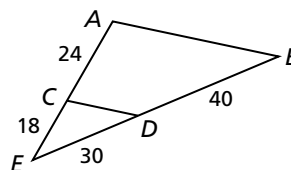


Verify that the given segments are parallel.

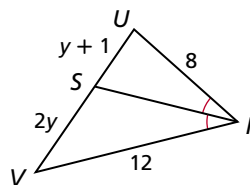
23. \overline{KL} and \overline{MN}



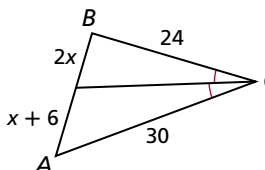
24. \overline{AB} and \overline{CD}



25. Find SU and SV .



26. Find the length of the third side of $\triangle ABC$.



27. One side of a triangle is x inches longer than another side. The ray bisecting the angle formed by these sides divides the opposite side into 3-inch and 5-inch segments. Find the perimeter of the triangle in terms of x .